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ABSTRACT

The paper focuses on reading-disabled students with emphasis on the need for theory-driven research and improvements in the training of teachers in reading instruction. Among abilities that should be tested in research on causes of reading disability are the child's understanding of the phonological structure of written language, a specifically language-related (rather than general analytical) deficit; and the child's short term memory ability. Also needed is research comparing children with specific reading retardation, attention deficits, hearing loss, arithmetic disabilities, and both high and low Intelligent Quotients. Deficits in teacher training programs include the short amount of time given to the teaching of reading and failure to teach the importance of alphabetic orthography. A five-page reference list is included. (DB)

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We should be grateful to Dr. Johnson for her thoughtful review of the major issues relating to definition, identification, and remediation of learning disabilities and for a remarkably comprehensive summary of what has been learned from research. I am delighted to have the chance to lend my support to many of the recommendations she proposes and to add one or two of my own, particularly in regard to that large and important group of the learning disabled whose special problem is reading.

In the ten minutes at my disposal, I have chosen to touch upon two points: the importance of theory-driven research and the need for improvements in the training of teachers in reading instruction.

I would agree with Dr. Johnson that a balanced, broad-spectrum behavioral test battery is a critical ingredient for research in reading disabilities. In practice, however, such test batteries have not been very successful. As Doehring et al (1981) have suggested, the results of most large-scale studies are ambiguous. In their view, and I would agree, this is because the test batteries used are typically not based on any coherent theory about what functions might or might not be involved in the reading process. The global measures of language, memory, and intelligence that constitute the typical comprehensive battery, even when psychometrically rigorous, have failed because they do

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not measure the right functions or else measure them in such a way that the result is possibly influenced by other quite irrelevant factors(Calfee, 1977).

Let us consider some functions that one might want to test in a search for the root causes of reading disability. A little reflection and a modicum of common sense would suggest that problems in reading might have something to do with language since it is a language that is being read.So language would surely be a prime candidate for consideration. But concern with language at the level of the usual clinical divisions of auditory receptive language and oral expressive language is not enough. I would instead consider the problems raised by the orthography, that is, by the particular way in which our alphabetic writing system conveys the language that is being read.

We know that in an alphabetic writing system the orthography taps into the language at the phonological level--that is, it represents the basic building blocks of language, the consonants and vowels. We also know from research (Liberman, Cooper, Shankweiler, & Studdert-Kennedy, 1967) that in spoken language, consonants are not separate sounds but are combined into consonant/vowel syllables. We might suppose therefore that it might not be immediately apparent to the learner that words have an internal structure of separable units that can be represented by the letter units of the orthography. Tests of this hypothesis have been carried out many times in many different languages in many different countries, and in all the results I know about, the hypothesis has been confirmed. It is indeed difficult for young children(Blachman, 1983; Fox & Routh,

1980; Goldstein, 1976; Helfgott, 1976; Liberman, Shankweiler, Fischer, & Carter, 1974; Zifcak, 1981), and, in fact, for illiterate adults(Byrne & Ledez, 1983;Liberman, Rubin, Duques, & Carlisle, 1985; Marcel, 1980; Morais, Cary, Alegria, & Bertelson, 1979), to understand that a word like "bag" which in speech seems to be a single, indivisible monosyllable has an internal structure of three separate segments that can be represented in print by three different letters. We are not surprised, therefore, to find in study after study around the globe that reading success is strongly associated with the degree to which the child or adult has acquired this understanding of the internal linguistic structure of words , or phonological awareness, as it has been called. To cite only a few studies,there is the work in Belgium of Alegria, Pignot, & Morais, 1982 ;in England, Bradley & Bryant, 1983 ;in Australia, Byrne & Ledez,1983; in the states, Read & Luyter, 1985; and Treiman & Baron, 1981 as well as my colleagues and me, Liberman, 1973; Mann & Liberman, 1984; in Sweden, Lundberg, Olofsson, & Wall, 1980 ; in Argentina, de Manrique & Gramigna, 1984, and so on.

If this understanding of phonological structure is difficult for the beginner to attain but is nonetheless so critical for reading success, it should not only be assessed but should also be trained where deficient(Liberman & Shankweiler, 1979). The next obvious question to ask is whether it can be trained. Recent research tells us that the analysis of words into their constituent elements can be taught successfully even to

very young children (Content, Morais, Alegria, & Bertelson, 1982, Olofsson & Lundberg, 1983) and furthermore that teaching children how to carry out this analysis can markedly improve the reading proficiency of many (Bradley & Bryant, 1983; Vellutino, 1985).

With all this as background, we can now raise a further question. That is whether the poor reader's inability to analyze words into their constituent elements reflects a general cognitive deficiency in analytic ability or is, alternatively, specifically linguistic in nature.Procedures for instruction and remediation could, of course, be drastically affected by the answer to that question. The research to date suggests that it may be specifically linguistic. Thus,a recent study (Morais, Cluytens, & Alegria, 1984) has shown that disabled readers aged six to nine were poorer than normal readers in segmenting words into their constituent parts , but performed as well as normal readers in a task that required them to deal in a similarly analytic way not with words but with musical tone sequences. In another study (Pratt, 1985), poor readers in the third grade and in adult education classes both had greater difficulties than normals with three different measures of phonological analysis but not with a nonlanguage analytic task identical in format to one of the two linguistic tasks. Thus it would appear that the deficiency was not due to some general analytic disability, but was specifically language- related.

A comprehensive test battery would need to take into account this question of specificity not only with regard to analytic ability, but with regard to other abilities that have been found to correlate with reading deficiency. For example,many

studies agree that short-term memory is deficient in children with reading problems(Shankweiler, Liberman, Mark, Fowler, & Fischer, 1979). We have considered that an efficient memory buffer is required to hold words while the reader (or listener) is making sense of the larger units-- phrases and sentences--they form. But there again we can ask whether the underlying difficulty is specifically linguistic or more general. Research to date suggests that the memory problems poor readers are material-specific-- that is, they occur with linguistic tasks but not when the materials to be remembered are outside the linguistic realm--faces, nonsense designs, and spatial arrays, for example (Katz. Shankweiler, & Liberman, 1981; Liberman, Mann, Shankweiler, & Werfelman,1982) . Here again, the designers of a test battery would need to keep this distinction in mind.

In fact,the designers of a test battery would do well to consider not only how language abilities may be related to other cognitive abilities, but also how the subsystems of language -- the phonological, syntactic, and semantic subsystems are interrelated. For example, it is known that disabled readers are poor in naming objects and have trouble comprehending complex sentences.Surprisingly, recent results (Katz,in press; Crain & Shankweiler, in press) suggest that their difficulty may be phonological in nature, and not semantic or syntactic , as one might initially have expected. In these cases, difficulties in the phonological component gave rise to problems in other linguistic domains.

Of course, no one would suggest that deficiencies in these

rather specific domains of language could possibly be the sole cause of all reading disabilities. But if not all reading disabilities are linguistically based, we must ask what characterizes those that have other sources? Can their performance be distinguished from that of children whose disability appears to be related to language? Here comparisons among children with specific reading retardation, attention deficits, hearing loss, arithmetic disabilities and both high and low IQ will be critical.

I would suggest that we already have sufficient knowledge to guide the development of a test battery that would be useful in these endeavors. Moreover, to effect change, we need not wait for all the answers to come in. As I have intimated earlier, there is a wealth of information from laboratories around the globe that could be put to use in preventing reading disabilities in many children and in remediating the problems of others. Here we encounter a major roadblock in the form of the inadequate training of teachers. Much of the criticism being leveled at teachers is, in my opinion, unfair. It is unfair because the problem is not with the teachers but with how they are being taught in the schools of education. In the first place,even for the teacher who is being trained to teach in the elementary grades, reading instruction is often squeezed into a one-semester so-called methods course along with math, science, social studies, health education, and I expect lately morals and sex education. Even when more time is allowed, what we have come to call the ordinary methods of instruction in reading may leave

much to be desired.

Teachers of beginning reading, for example, are being trained to teach reading in an alphabetic orthography without ever being taught how an alphabetic orthography represents the language or indeed why it is important for beginning readers to explicitly understand the internal structure of words the orthography represents. The prospective teachers are not being taught the critical role this kind of phonological awareness can play in the child's mastery of the alphabetic principle even though its relevance has been confirmed over and over again, as we have seen. In fact, they are all too often provided with an instructional procedure that directs them specifically not to trouble the child with details of how the orthography works. Luckily, many children will pick up the alphabetic principle on their own-- that is, they simply begin to discover for themselves the commonalities between similarly spoken and written words. These children turn out to be the ones with strength in phonological awareness.

Unfortunately, the many children with weakness in phonological awareness may never discover on their own how the alphabet works and will simply join the ranks of the millions of functional illiterates with their little stores of memorized words and no strategies for deciphering a new word. (An example would be the man in an adult education class who could recognize the word<u>photograph</u>, but had no idea how to decipher the word <u>peg</u>.) Some of these children with deficient phonological awareness may eventually be led to discover what they need to know by individualized instruction with a special education

teacher. But they will meanwhile have lost precious time for the practice that is essential in the mastery of any skill . I would ask why we should require children to fail before we teach them what they need to know. Why not introduce them to the alphabetic principle at the start of instruction in reading?Indeed, why not introduce teachers to what they need to know to prevent failure?

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